

I CLAIM,

1. An explosion-proof hot water heater comprising an inner casing having conduit means to admit water in a water chamber thereof and to remove it therefrom, an outer skin casing spaced from said inner casing with thermal insulation between said casings, said inner casing being supported over a gas-fired combustion chamber at a lower end thereof, said combustion chamber having a sealed bottom wall and a circumferential side wall, a fuel burner in said combustion chamber, combustion air intake ports in said circumferential side wall above said sealed bottom wall, a support base for supporting said sealed bottom wall elevated from a support surface, air intake openings about said outer skin casing spaced a predetermined distance above said sealed bottom wall, air passage means communicating said air intake openings with said combustion air intake ports of said combustion chamber, and a gas vapour sensor secured in relation to said support base below said sealed bottom wall and adapted to cause said burner to be shut off upon detection of explosive vapours.

2. An explosion-proof hot water heater as claimed in claim 1 wherein said combustion air intake openings are disposed spaced above said combustion air intake ports of said combustion chamber.

3. An explosion-proof hot water heater as claimed in claim 2 wherein said support base has a height of approximately one inch, said air intake openings being disposed at least two inches above said support base.

4. An explosion-proof hot water heater as claimed in claim 3 wherein said support base has a circumferential side wall, said gas vapour sensor being secured inside said support base and having a gas sensing element secured to

said circumferential side wall to detect the presence of explosive vapours adjacent said support surface.

5. An explosion-proof hot water heater as claimed in claim 4 wherein said support base is provided with venting apertures thereabout to cool said sealed bottom wall.

6. An explosion-proof hot water heater as claimed in claim 4 wherein the distance between said gas sensing element and said air intake openings provides an approximate time delay of two minutes for said explosive vapour to rise to said intake openings.

7. An explosion-proof hot water heater as claimed in claim 2 wherein said air passage means comprises a circumferential air deflecting wall spaced inwardly of said outer skin casing adjacent said air intake openings for directing air aspired by said burner downwardly towards said sealed bottom wall and then through passage means disposed spaced adjacent said combustion air intake ports.

8. An explosion-proof hot water heater as claimed in claim 7 wherein said air deflecting wall has a curved top portion defining an outer circumferential outer edge dimensioned to abut against an inner surface of a bottom portion of said outer skin casing.

9. An explosion-proof hot water heater as claimed in claim 8 wherein said air deflecting wall has a straight bottom portion defining a lower circumferential edge adapted to rest on said sealed bottom wall, and openings disposed about said straight bottom portion adjacent said lower circumferential edge and consisting said passage means.

10. An explosion-proof hot water heater as claimed in claim 9 wherein a circumferential spacing means is secured to said straight bottom portion and disposed above said openings and extends between said straight bottom portion and said circumferential side wall of said combustion chamber, and a fireproof thermal insulation jacket, said air deflecting wall and said side wall of said combustion chamber, said insulation jacket having air passages aligned with said openings of said straight bottom portion of said air deflecting wall.

11. An explosion-proof hot water heater as claimed in claim 1 wherein said circumferential side wall of said combustion chamber is constituted by a steel cylinder centrally secured on said sealed bottom wall, said cylinder having a cylindrical bead extending inwardly adjacent a top edge of said cylinder and dimensioned to supportingly receive a bottom circumferential edge of said inner casing thereon and in close fit with a top portion of said cylinder.

12. An explosion-proof hot water heater as claimed in claim 11 wherein said sealed bottom wall is constituted by a pan bottom wall, said pan bottom wall having a circumferential flange extending upwardly, said pan being dimensioned to receive a bottom portion of said outer skin casing in close-fit therebehind to be supported on said sealed bottom wall.

13. An explosion-proof hot water heater as claimed in claim 11 wherein said combustion chamber has a concave bottom wall and a central flue pipe extending from said concave bottom wall through said water chamber and out of said hot water heater to connect to a chimney to exhaust combustion fumes.

14.           An explosion-proof hot water heater as claimed in claim 1 herein said gas vapour sensor is connected to a switching circuit which operates a gas supply valve to shut off gas supply to said fuel burner to extinguish same.